

Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Conducted Test Report FCC ID: NWJ10A008A Test Standards- FCC Part 24

Table of Contents

RF Power Output.....	3
Conducted Occupied Bandwidth – 1900 MHz GSM	4
Data	4
Worst Case Channel 810	4
99% Occupied Bandwidth.....	4
Conducted Spurious Emission – 1900 MHz GSM	5
Channel 512.....	5
9KHz -1.84 GHz.....	5
1.84 GHz -1.85 GHz.....	6
1.86 GHz - 7.00 GHz.....	7
7.00 GHz - 20.00 GHz.....	8
Channel 661.....	9
9KHz -1.876 GHz.....	9
1.876 GHz -1.87898 GHz.....	10
1.89 GHz - 7.00 GHz.....	11
7.00 GHz - 20.00 GHz.....	12
Channel 810.....	13
9KHz -1.90 GHz.....	13
1.90 GHz -1.90898 GHz.....	14
1.92 GHz - 7.00 GHz.....	15
7.00 GHz - 20.00 GHz.....	16
Frequency Error -vs- Temperature	18
Frequency Error -vs- Voltage.....	19
Testing Laboratory	20
Contact information:.....	20
Test Equipment List:	20

RF Power Output

Pursuant to FCC Rules 2.985

PCS	Freq (MHz)	Freq (MHz)	Freq (MHz)	Upper Spec	Lower Spec	Result
PCL	1850.20	1880.00	1909.80			
0	30.0	30.0	30.0	32	28	Pass
15	0.7	0.7	0.6	5	-5	Pass

Method of Measurement

The RF power output is measured with the transmitter adjusted in accordance with the tune-up procedure to give the value of voltage and current specified in the tune-up procedure to give the value of voltage and current specified in the operation description as required by 2.983(d) (5).

The power measurements were made using a Rohde & Schwartz CMU-200 telecommunications analyzer with the mobile in a simulated call.

Minimum Standard

The specifications met are per ETSI TS 100-910 Section 4.1.

Conducted Occupied Bandwidth – 1900 MHz GSM

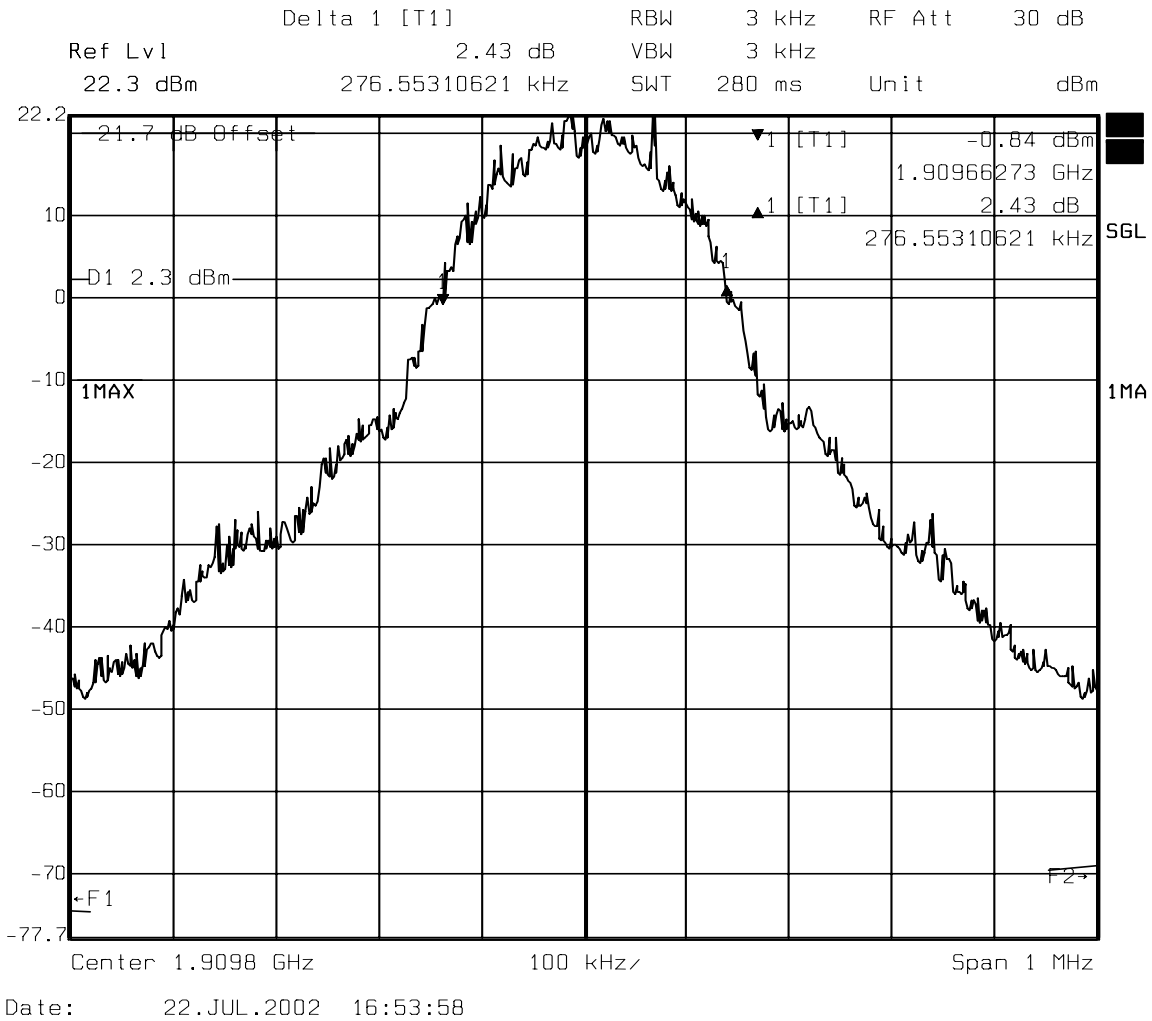
Pursuant to FCC Rules 2.991, 24.238

Data

Frequency (MHz)	Channel	99% Occupied Bandwidth (KHz)	-26 dBc Bandwidth (KHz)
1850.2	512	262.525	312.625
1880.0	661	270.549	314.629
1909.2	810	276.553	312.625

Worst Case Channel 810

99% Occupied Bandwidth

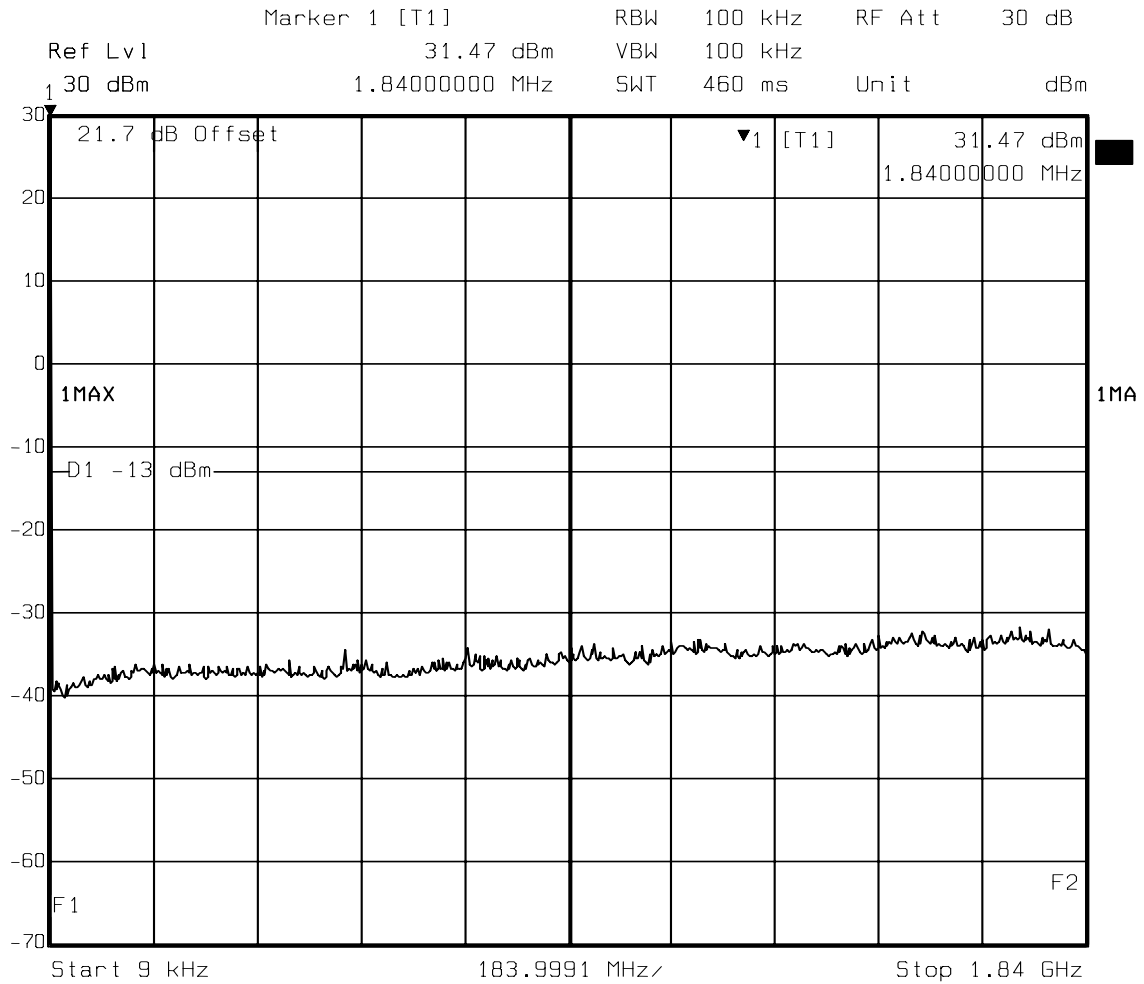


Conducted Spurious Emission – 1900 MHz GSM

Pursuant to FCC Rules 2.991, 24.238

Channel 512

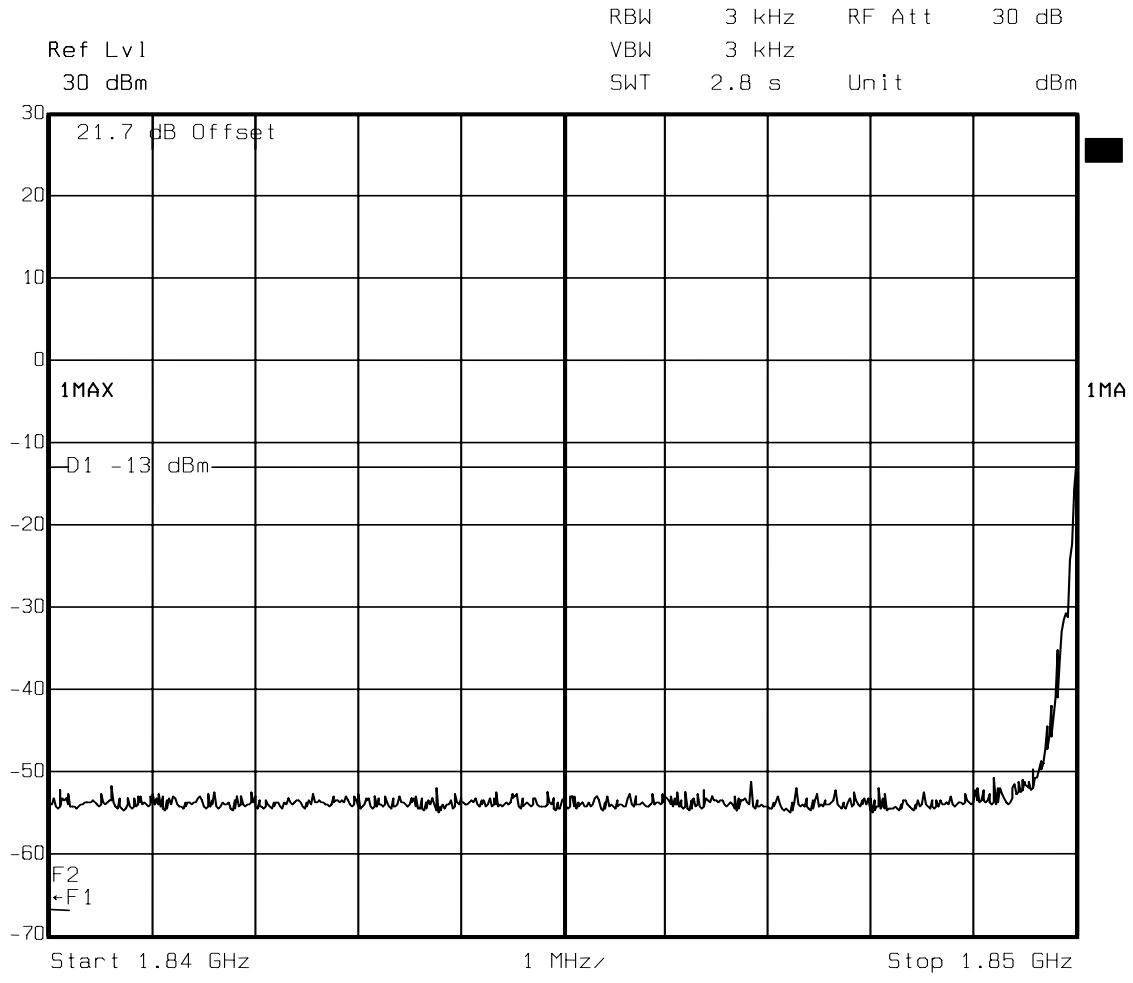
9KHz -1.84 GHz



Date: 22.JUL.2002 14:19:28

Channel 512

1.84 GHz -1.85 GHz



Date: 22.JUL.2002 14:22:27

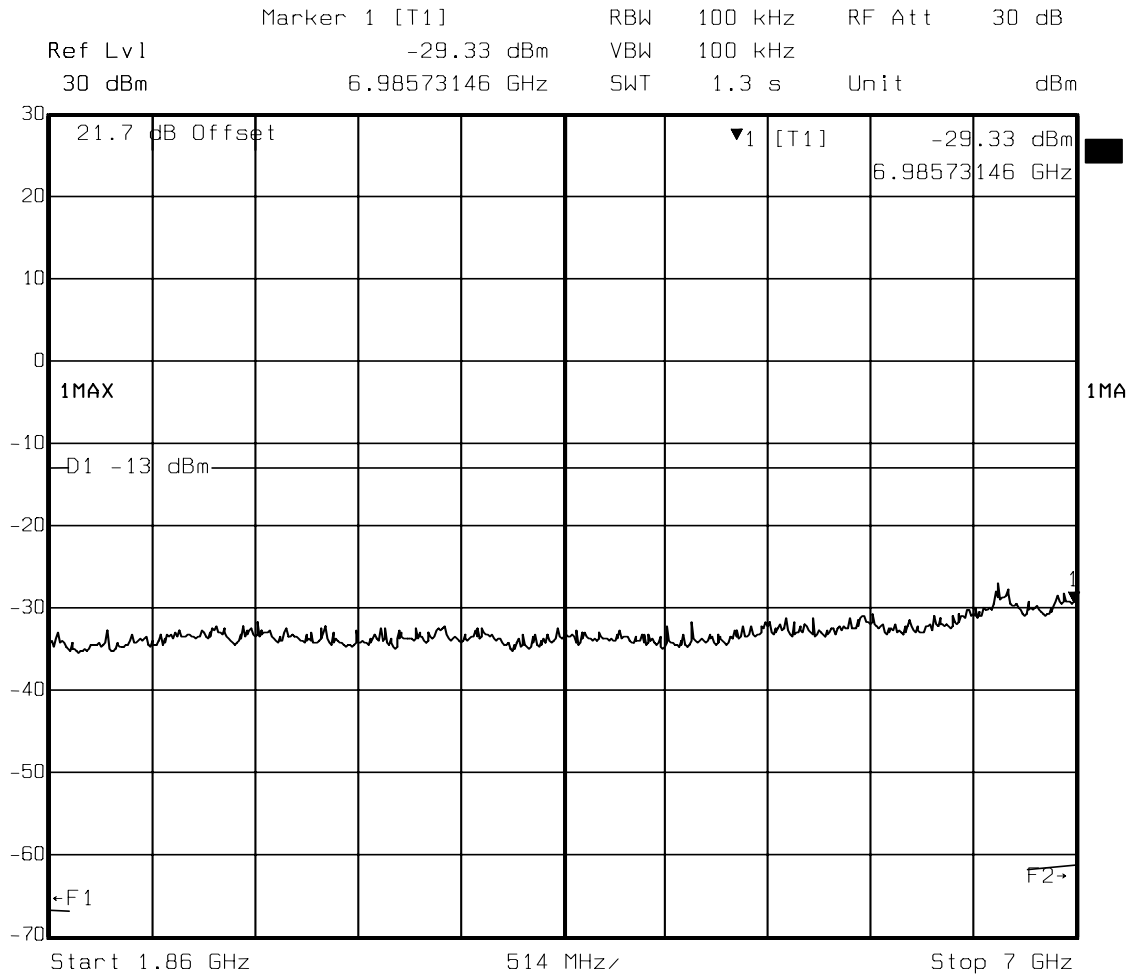
Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Channel 512

1.86 GHz - 7.00 GHz



Date: 22.JUL.2002 14:24:47

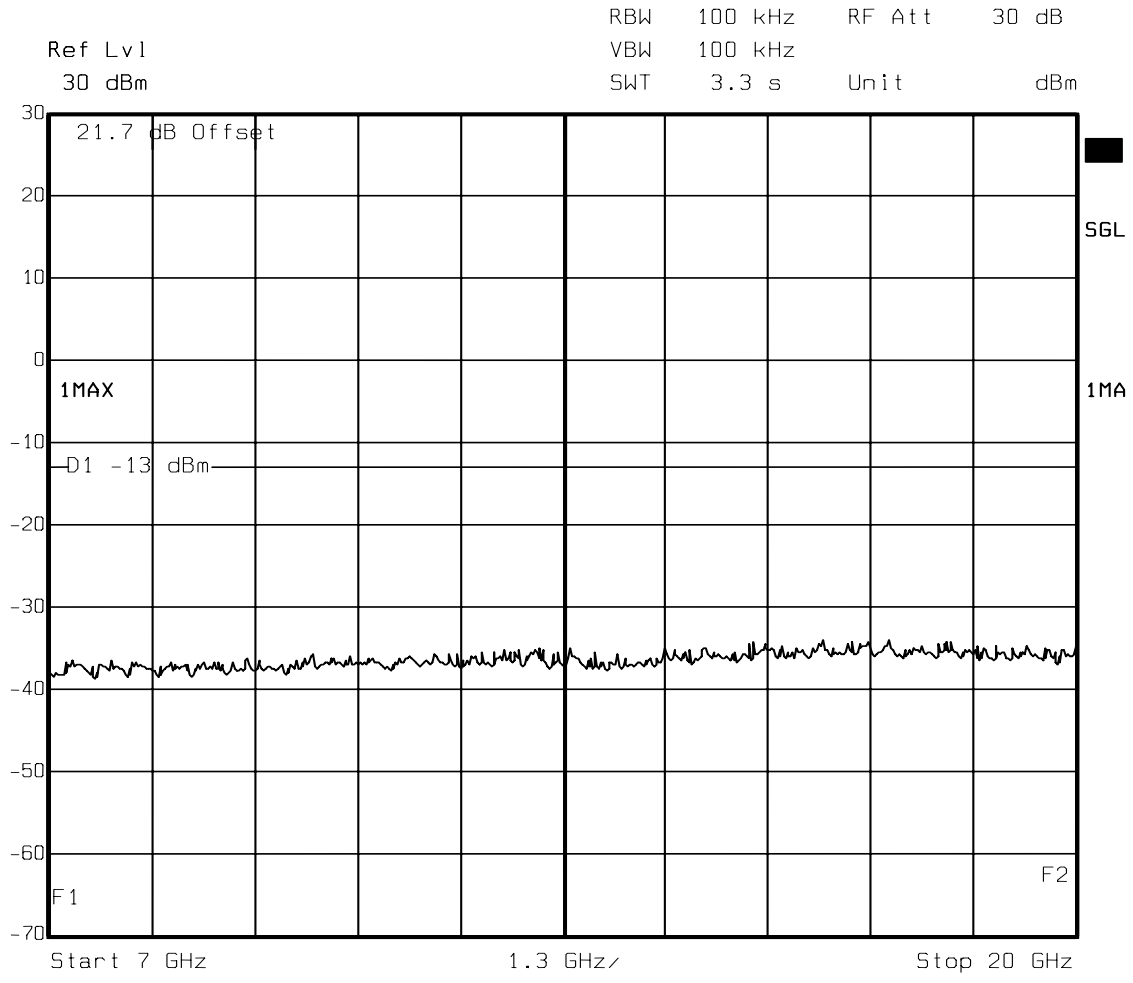
Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Channel 512

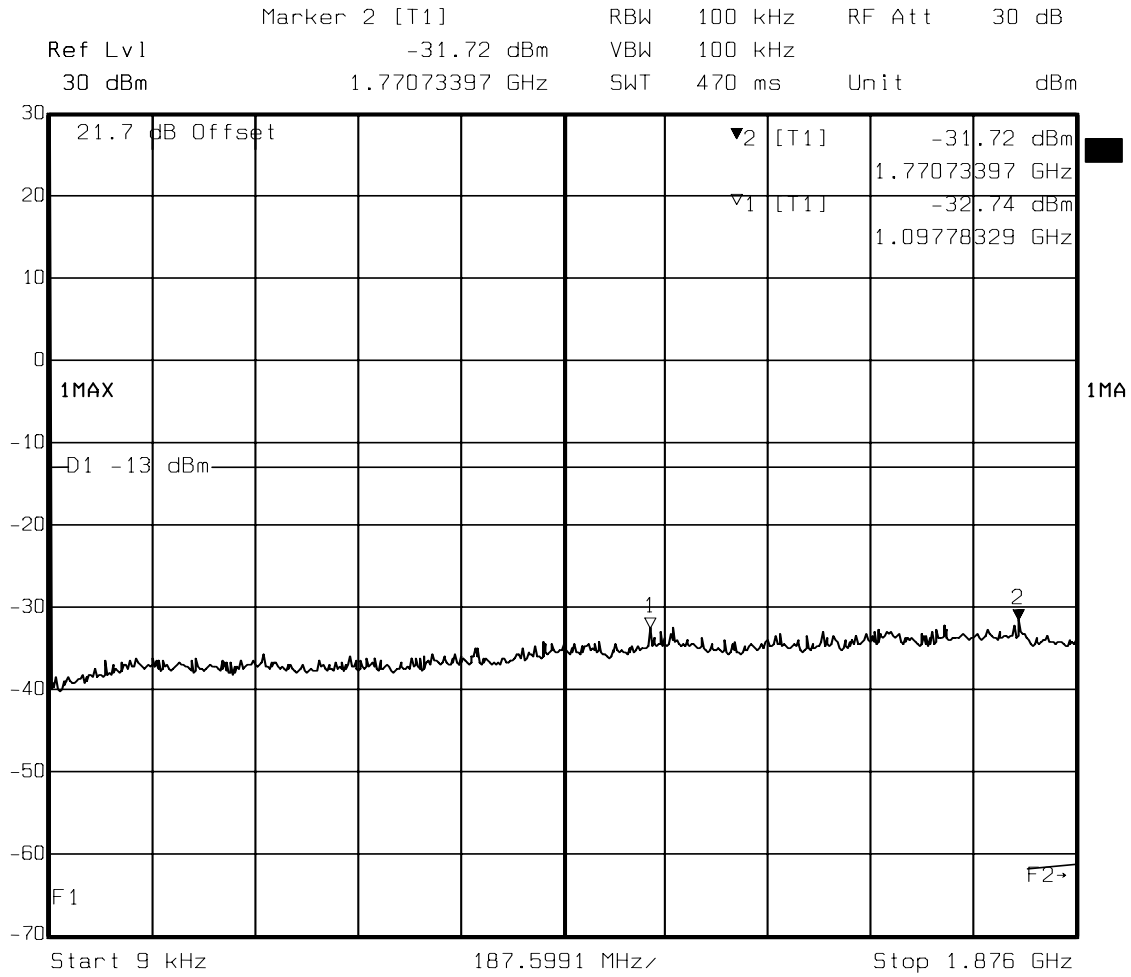
7.00 GHz - 20.00 GHz



Date: 23.JUL.2002 16:33:24

Channel 661

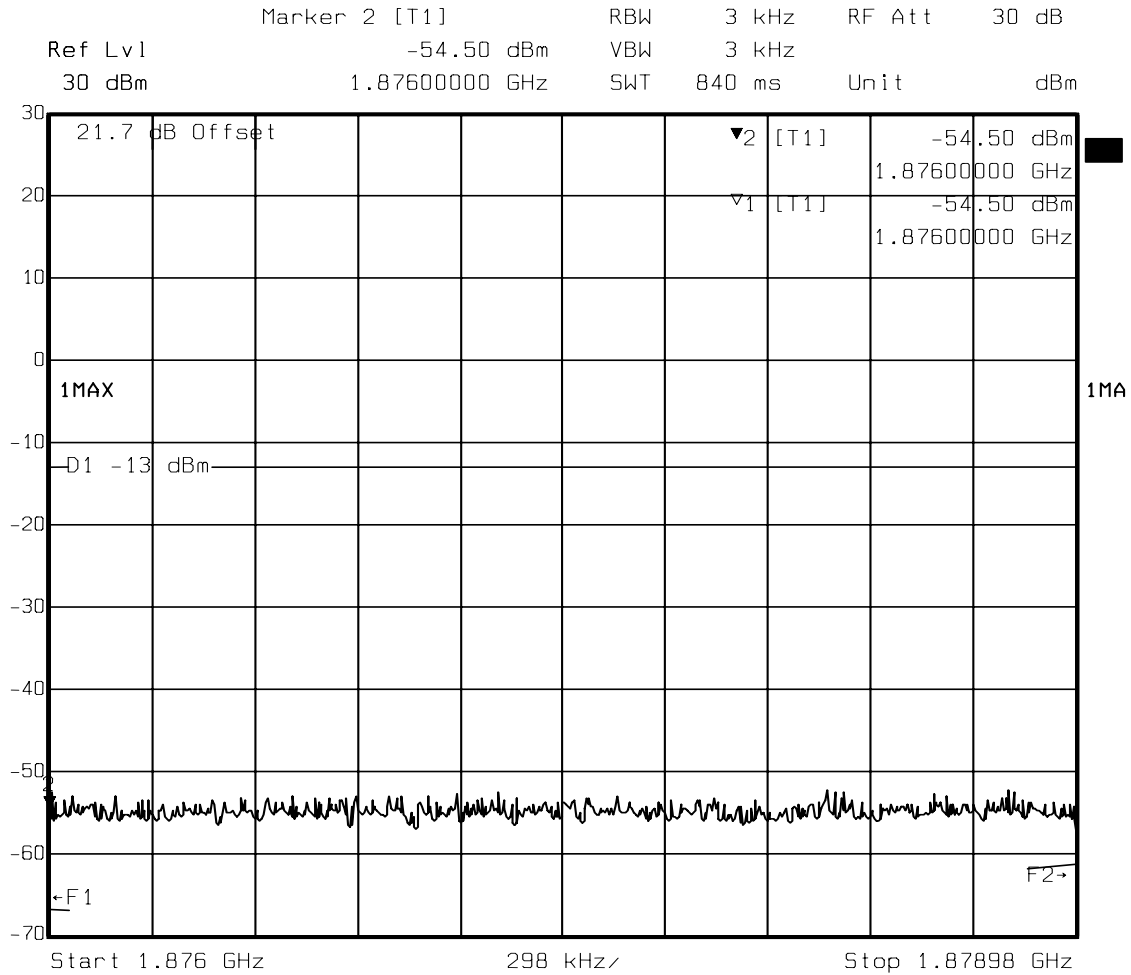
9KHz -1.876 GHz



Date: 22.JUL.2002 14:34:14

Channel 661

1.876 GHz - 1.87898 GHz



Date: 22.JUL.2002 14:37:43

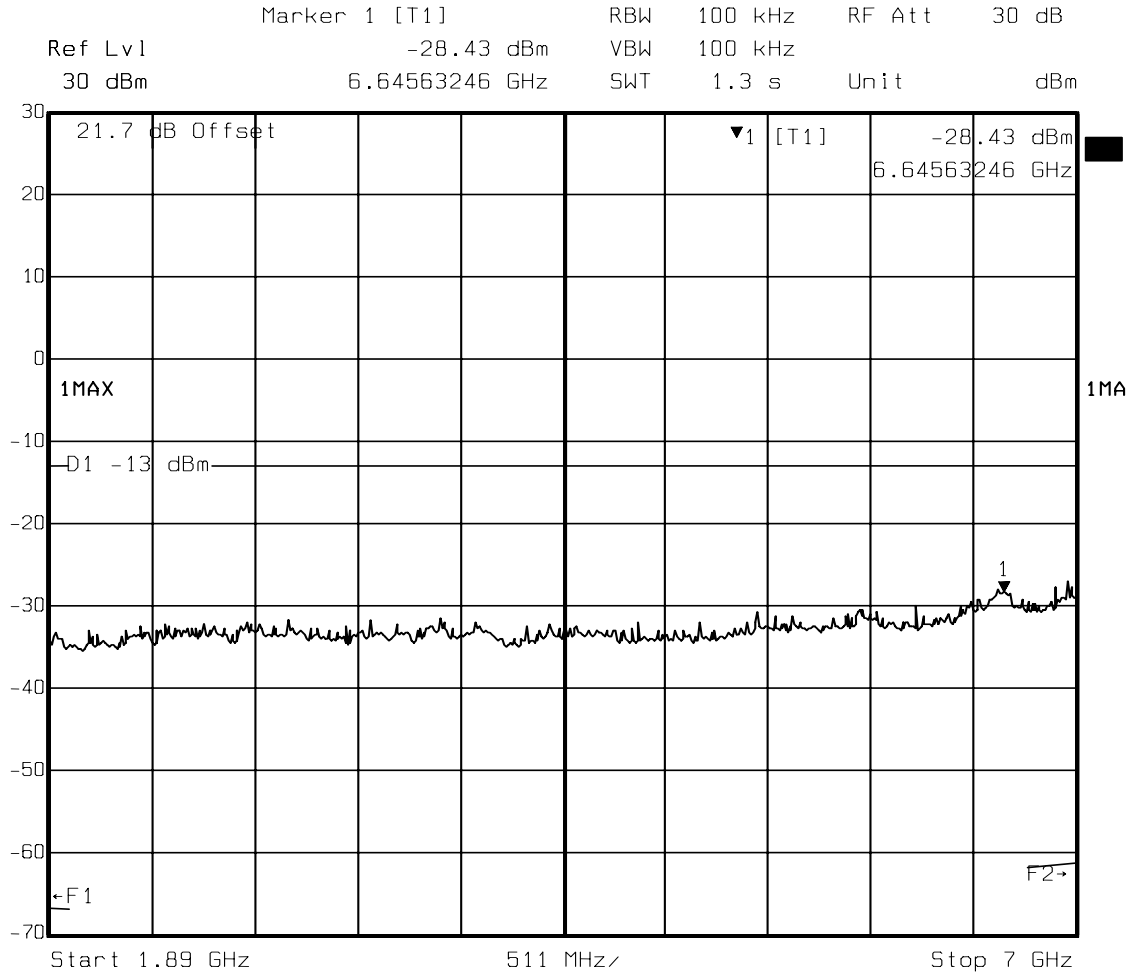
Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Channel 661

1.89 GHz - 7.00 GHz



Date: 22.JUL.2002 14:31:57

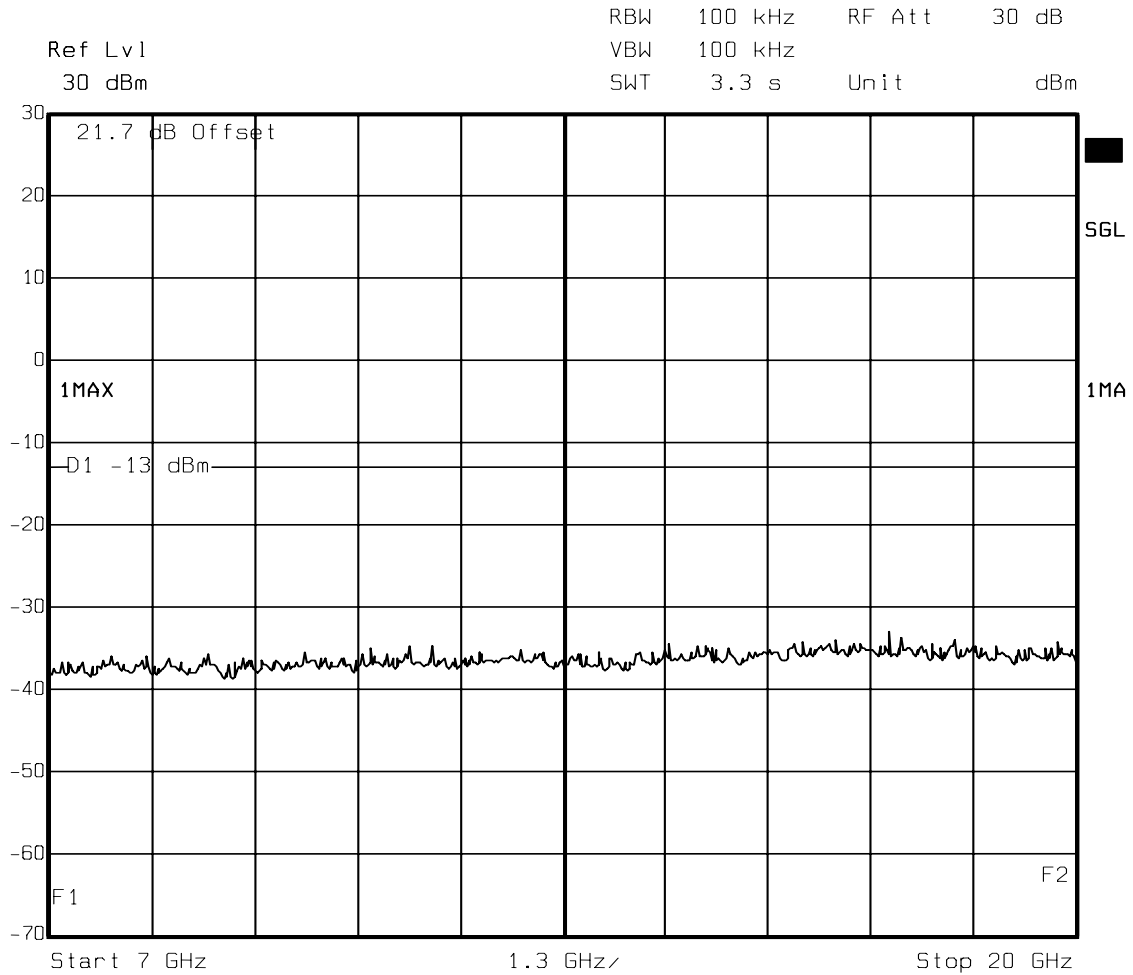
Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Channel 661

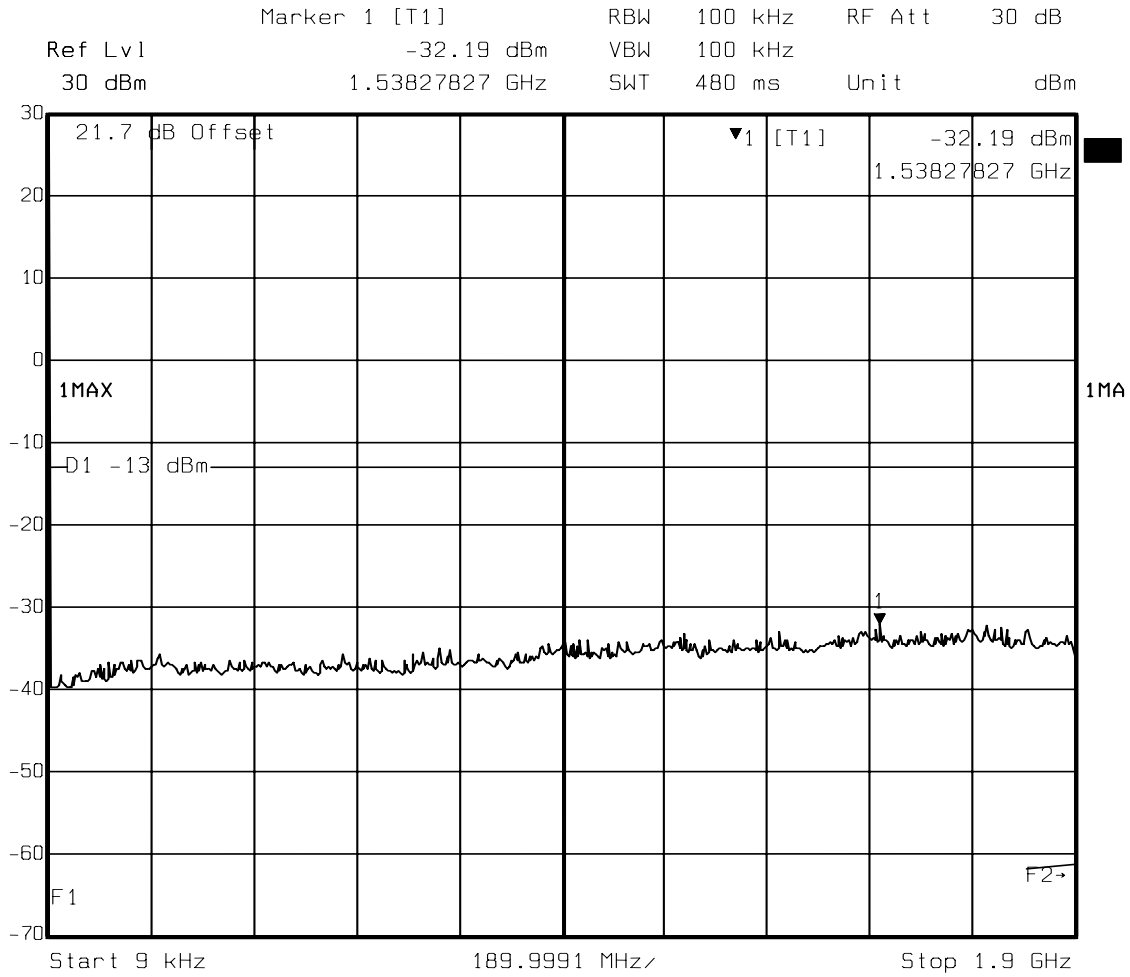
7.00 GHz - 20.00 GHz



Date: 23.JUL.2002 16:29:20

Channel 810

9KHz -1.90 GHz



Date: 22.JUL.2002 14:39:01

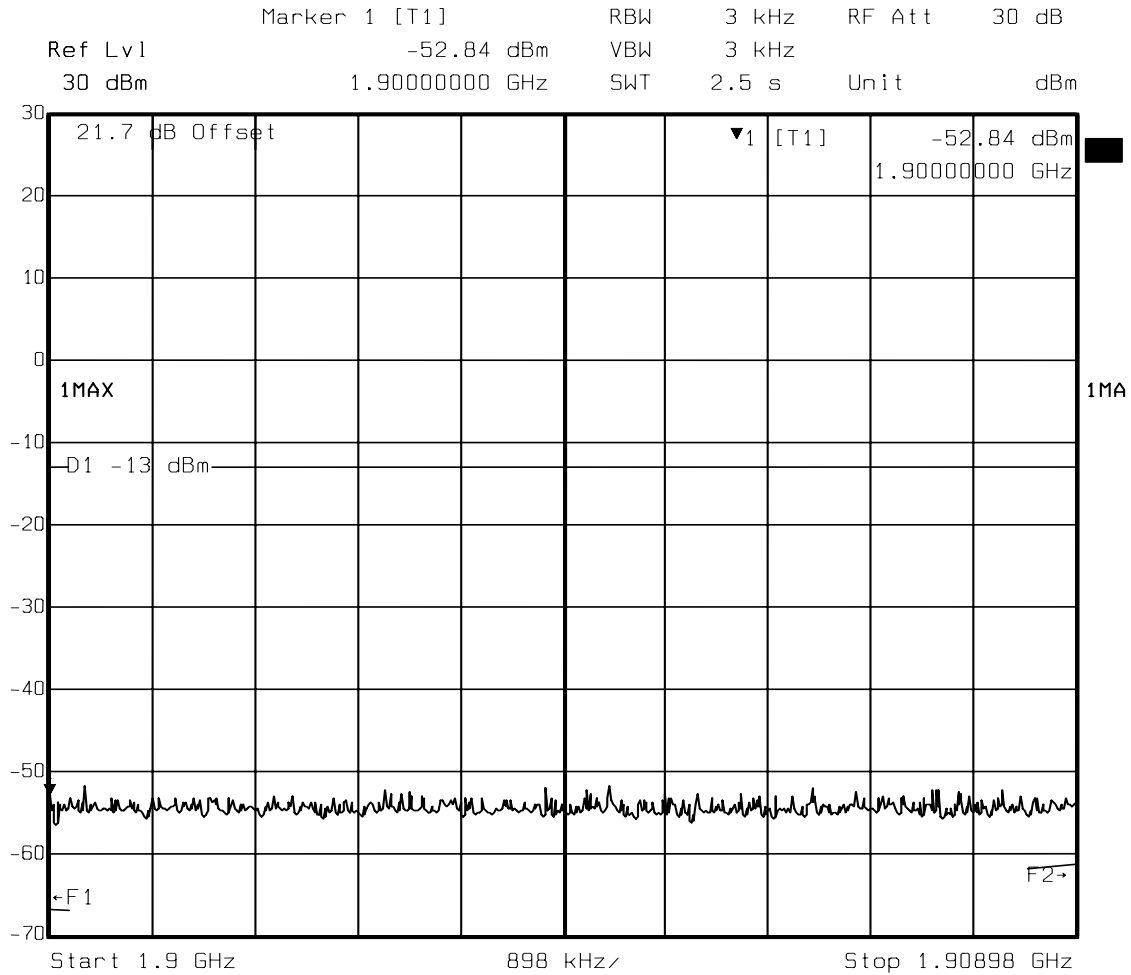
Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Channel 810

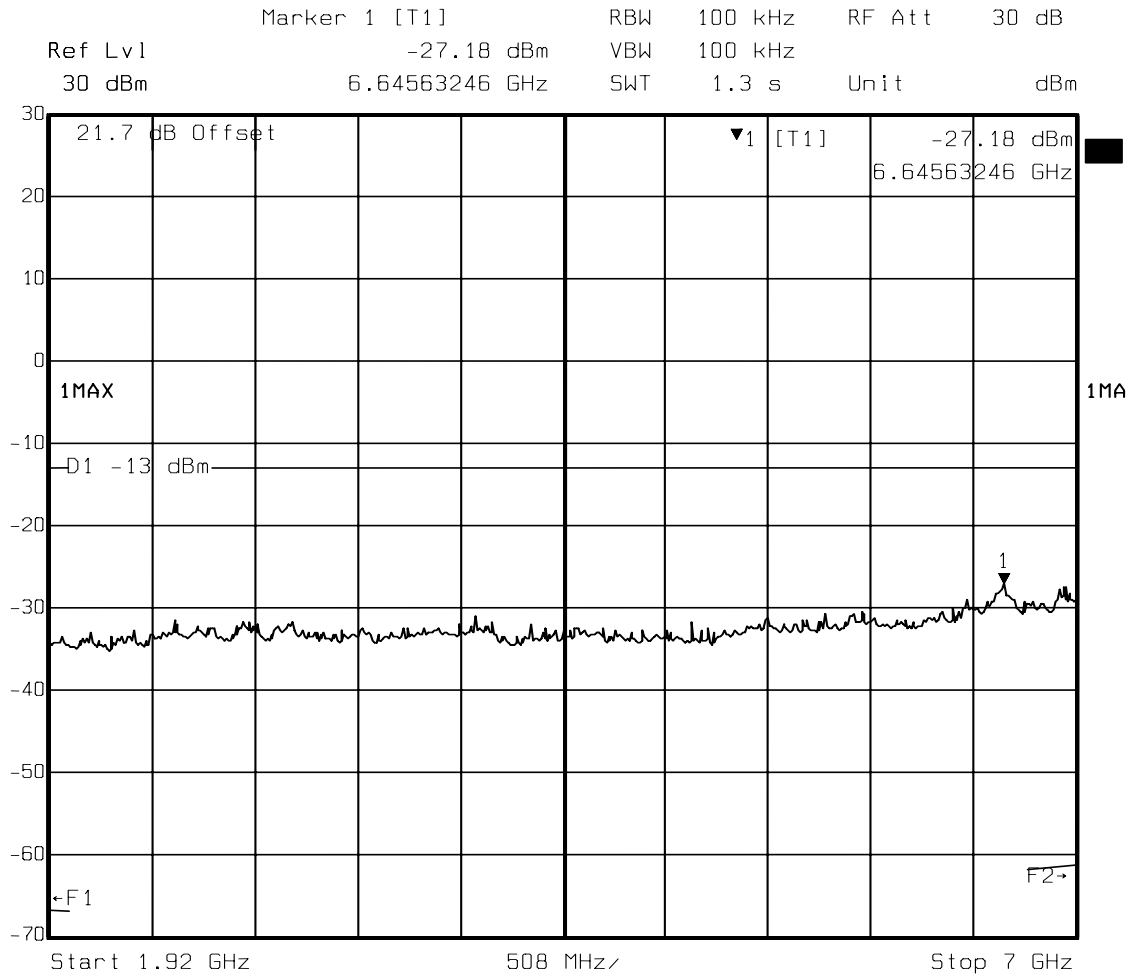
1.90 GHz -1.90898 GHz



Date: 22.JUL.2002 14:40:22

Channel 810

1.92 GHz - 7.00 GHz



Date: 22.JUL.2002 14:30:30

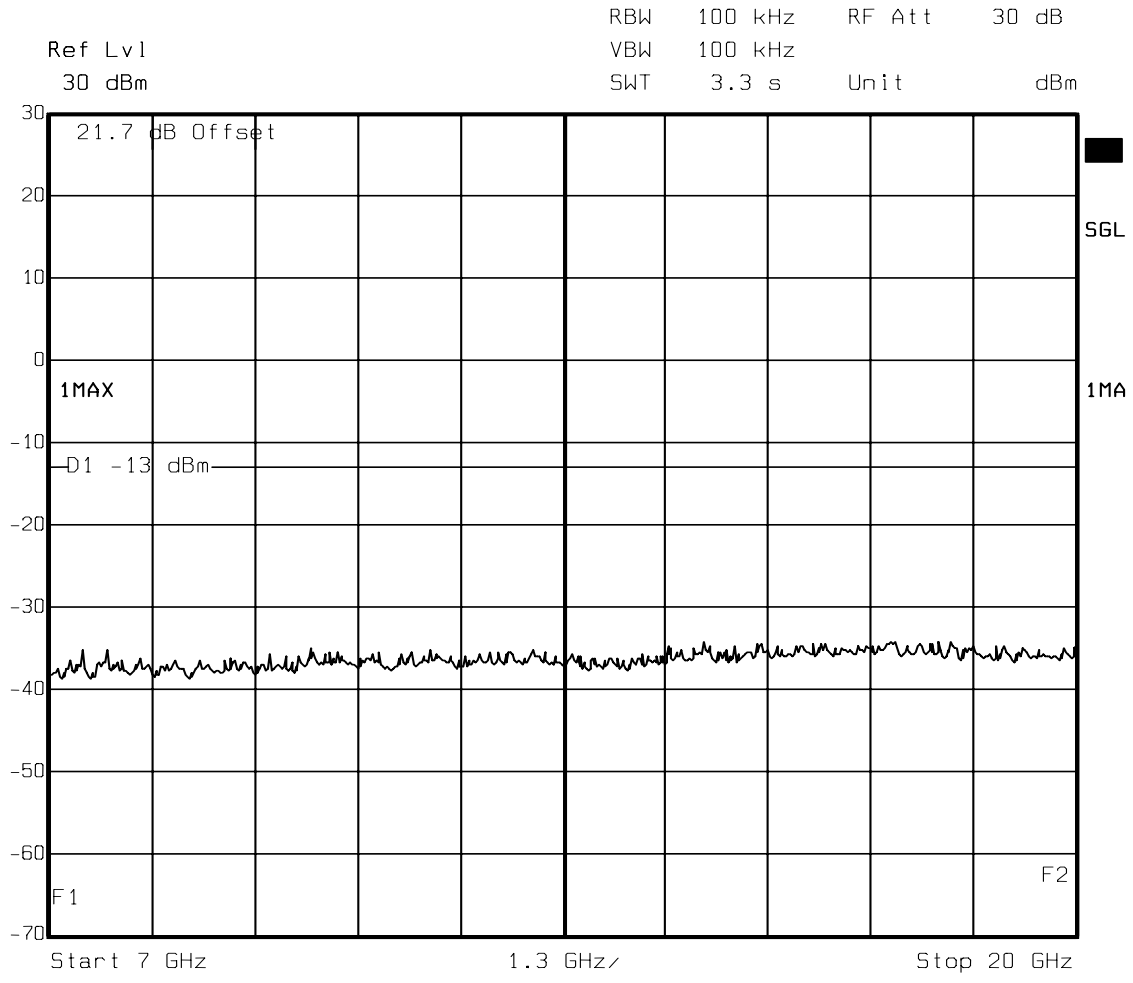
Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Channel 810

7.00 GHz - 20.00 GHz



Date: 23.JUL.2002 16:32:00

Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Method of Measurement:

The transmitter is terminated into a 50-ohm load and interfaced with a Rohde & Schwartz FSEM-20 spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. The transmitter is modulated with a pseudo random data. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier.

FCC Limits

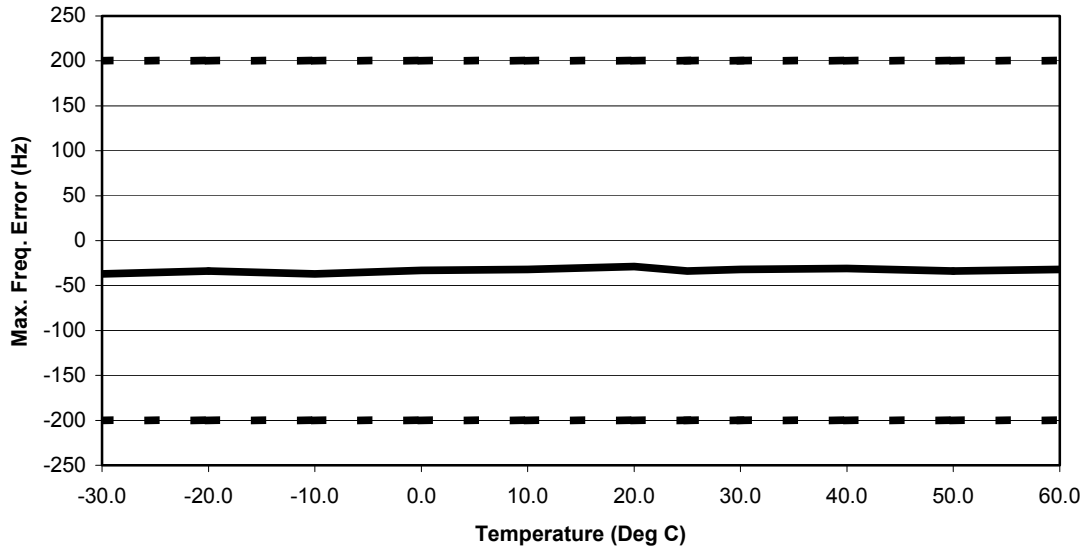
The mean power of emissions must be attenuated below the mean power of the carrier (P) on any frequency outside the frequency block by: at least $43+10 \log P$ dB.

In the case of a +30 dBm device this becomes a constant specification of -13 dBm.

Frequency Error -vs- Temperature

Pursuant to FCC Rules 2.995(a)

Frequency Error -vs- Temperature



Method of Measurement:

Frequency measurements are made at the extremes of the temperature range - 30 to +60 degrees centigrade and at intervals of not more than 10 degrees centigrade through out the range. Sufficient time is allowed prior to each measurement for the circuit components to stabilize.

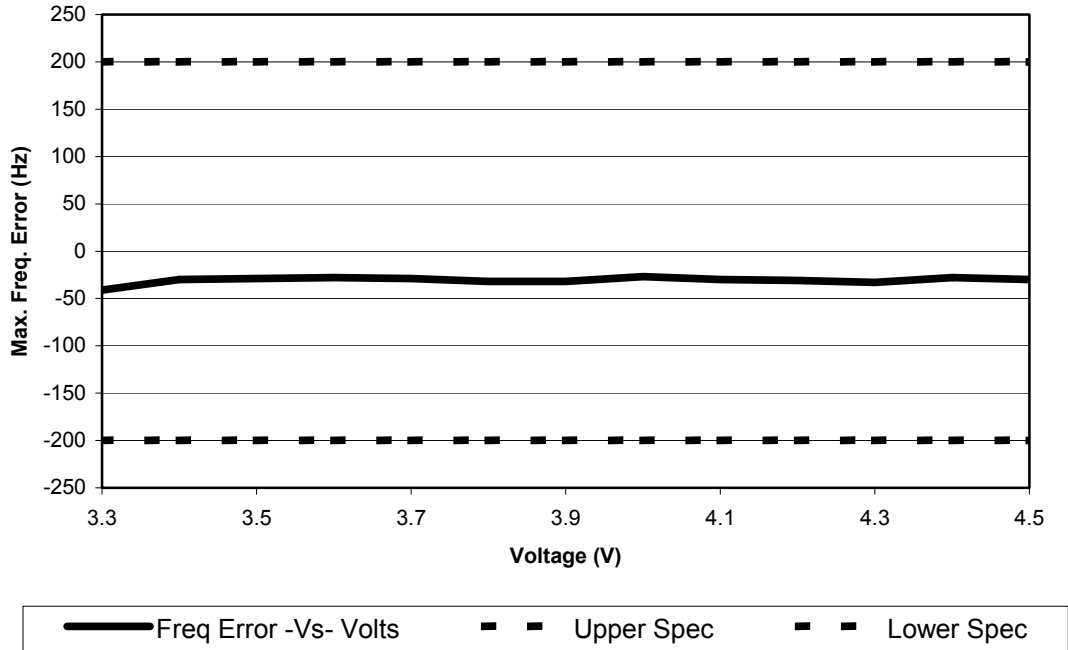
FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 24.235: - +200 Hz from -30 to +60 degrees centigrade

Frequency Error -vs- Voltage

Pursuant to FCC Rules 2.995(d)

Frequency Error -vs- Voltage



Method of Measurement:

The primary voltage was varied from 90% to 120% of the normal supply voltage. The low voltage cutoff for this product is at 3.3V. Testing below this voltage is not possible. Voltage is measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 24: - +200 Hz from 85% to 115% of nominal voltage.

Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Testing Laboratory

Contact information:

Panasonic MMCD Hardware Verification Test Labs

1225 Northbrook Parkway

Suwanee, Ga 30024

POC.

Pieter Seidel

Technical Group Leader

Hardware Verification

Phone: (770) 338-6270

Fax: (770) 338-6253

Email: pseidel@panasonicatlanta.com

Test Equipment List:

Number	Instrument	Make	Model	Serial Number	Calibration Date
1	Telecommunications Analyzer	Rohde & Schwartz	CMU-200	100930	11/29/2001
2	Spectrum Analyzer	Rohde & Schwartz	FSEM-20	100001	11/29/2001
3	Temperature Chamber	Thermotron	S-1.2C	28950	N/A
4	Hi-Speed Switching Power Supply	Keithly	2304	799715	3/28/2002

Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

Test System and Measurement Procedure

NWJ10A008A

Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

TEST SETUP.....	3
RF POWER OUTPUT.....	3
Block Diagram.....	3
Method of Measurement	3
Minimum Standard	3
RADIATED SPURIOUS EMISSIONS	4
Test Site & method:	4
Minimum Standard:	4
RADIATED POWER	4
Test Site & method:	4
Minimum Standard	4
CONDUCTED SPURIOUS EMISSIONS	5
Block Diagram.....	5
Method of Measurement:	5
Minimum Standard:	5
FREQUENCY STABILITY.....	6
Block Diagram.....	6
Method of Measurement:	6
Minimum Standard:	6

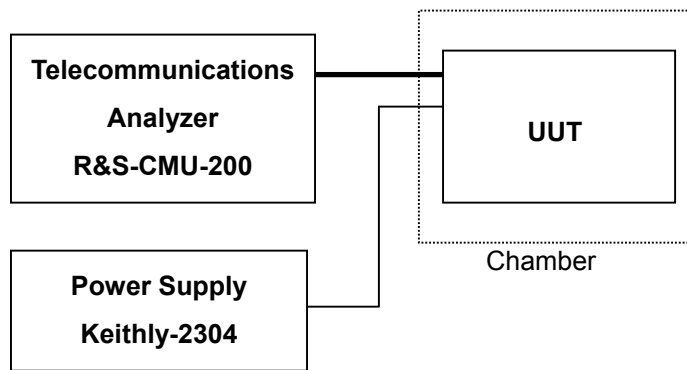
TEST SETUP

The test system used to take the conducted data for this report is automated. The shaded components are common to every test and the measurement determines the signal flow from the switch. All path losses are included in the measurements. The UUT is placed in the chamber and the cables are run into it through ports. All dark Lines are RF paths and light lines are audio and DC lines.

RF POWER OUTPUT

Pursuant to FCC Rules 2.985 (a)

Block Diagram



Test Setup for Power Output

Method of Measurement

The RF power output is measured with the transmitter adjusted in accordance with the tune-up procedure to give the value of voltage and current specified in the tune-up procedure to give the value of voltage and current specified in the operation description as required by 2.983(d) (5).

The power measurements were made using a Rohde & Schwartz CMU-200 telecommunications analyzer with the mobile in a simulated call.

Minimum Standard

The specifications met are per ETSI TS 100-910 Section 4.1.

Panasonic

Matsushita Mobile Communications Development Corporation of U.S.A.

FCC ID: NWJ10A008A

RADIATED SPURIOUS EMISSIONS

Pursuant to FCC Rules 2.993

Test Site & method:

All information and methods are in a separate report issues by **PCTEST** an independent lab contracted to do this measurement. See Attachment E.

Minimum Standard:

FCC Limits -- Per Applicable Rule Parts.

Radiated spurious emissions shall be attenuated below the maximum level of emission of the carrier frequency in accordance with the following formula: Spurious attenuation in dB = $43 + 10 \log_{10}$ (Power output in watts)

RADIATED POWER

Pursuant to FCC Rules 22.913(a) & 24.232

Test Site & method:

All information and methods are in a separate report issues by **PCTEST** an independent lab contracted to do this measurement. See Attachment E.

Minimum Standard

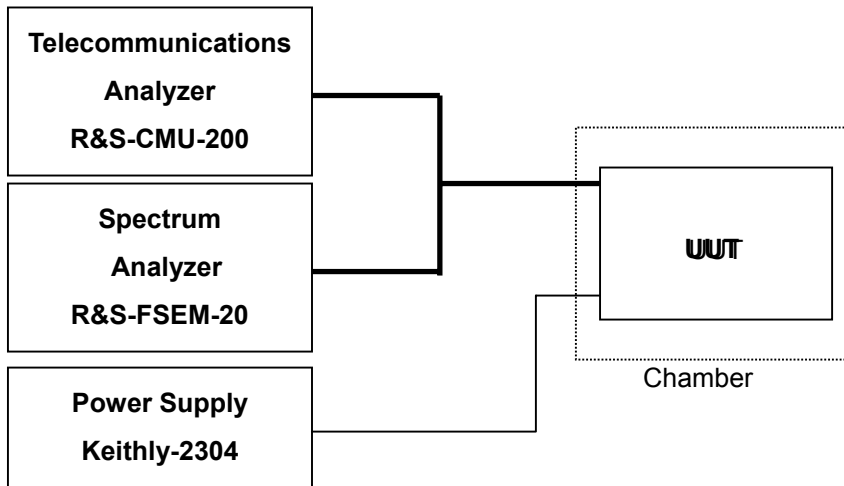
FCC Limits -- Per Applicable Rule Parts.

That no power level exceeds 600 mW ERP for part 22 and 2000 mW EIRP for part 24.

CONDUCTED SPURIOUS EMISSIONS

Pursuant to FCC Rule 2.991

Block Diagram



Test Setup for Conducted Spurious

Method of Measurement:

The transmitter is terminated into a 50-ohm load and interfaced with a spectrum analyzer that allows the spurious emission level relative to the carrier level to be measured directly. The Mobile is placed into a simulated call using a pseudo random data pattern with the telecommunications analyzer.

Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier or as high as the state of the art permits except for that region close to the carrier equal to + 250% of the authorized bandwidth.

Minimum Standard:

FCC Limits: Per Applicable Rule Part 24.232B.

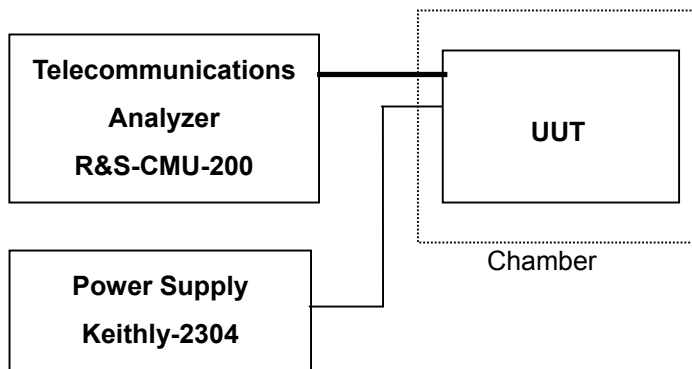
Conducted spurious emissions shall be attenuated below the maximum level of emission of the carrier frequency in accordance with the following formula:

Spurious attenuation in dB = 43 + 10 log 10 (Power output in watts).

FREQUENCY STABILITY

Pursuant to FCC Rule 2.995(a, d)

Block Diagram



Test Setup for Frequency Stability

Method of Measurement:

A. Temperature (Non-heated type crystals oscillators):

Frequency measurements are made at the extremes of the temperature range -30 to $+60$ degrees centigrade and at intervals of not more than 10 degrees centigrade through out the range. Sufficient time is allowed prior to each measurement for the circuit components to stabilize.

B. Power Supply Voltage:

The primary voltage was varied from 85% to 115% of the normal supply voltage. Voltage is measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Minimum Standard:

FCC Limits -- Per 2.995 (1) & (2) and Applicable Rule Parts.

Part 24:

Temperature - ± 200 Hz from -30 to $+60$ degrees centigrade

Power Supply Voltage - ± 200 Hz from 85% to 115% of nominal voltage.